

Research Plan of the CPHHD as a Whole

Introduction and overview of the entire CPHHD application

a. Specific aims of the CPHHD

The second goal of Healthy People 2010 (after “to increase quality and years of healthy life”) is to the eliminate health disparities among demographic groups in the United States. The report outlines differences that occur by gender, race or ethnicity, income or education, geographic location, and sexual orientation. Although significant group differences have been noted for almost a hundred years, our understanding of how these differences come about is not yet well developed. Although work within scientific disciplines has shed light on the factors that contribute to health disparities, lacking is a clear understanding of how social and behavioral factors interact with the physical environment to influence group differences in health outcomes. An approach is needed that draws together scientists from a variety of disciplines to pool ideas and develop a shared language, new measures, and innovative methods that would allow the development of a broader understanding of the determinants of health disparities. For the results of scientific investigations to be successfully translated into action plans for eliminating health disparities, they must draw upon the knowledge and resources of communities of persons vulnerable to adverse health conditions and capture the needs and life realities of those communities.

Although the importance of interdisciplinary research is being recognized increasingly (Institute of Medicine, 2001), obstacles to achieving true collaboration are inherent in university structures. Kahn and Prager (1994, p. 12) point out that competition for funds, separate disciplinary languages and methods, and rewards for publishing frequently and on narrow topics impede collaboration by investigators from different disciplines. When communication and collaboration occur, they are most likely to occur between disciplines that fall within the same level of analysis (e.g., social/environmental, behavioral/psychological, and biological/genetic).

The University of Chicago has a rich history of shared research and teaching among groups of faculty with common interests. The Institute for Mind and Biology and the School of Social Service Administration, two of the hosts of the proposed Center, represent examples of the University’s interdisciplinary tradition. The Biological Sciences Division, the Center’s third host, has a history of interdisciplinary training (e.g., its M.D./Ph.D. Program in Medicine, Arts, and Social Sciences). The long-term objective of the proposed Center for Interdisciplinary Health Disparities Research is for scholars to move from solid interdisciplinary bases to achieve a transdisciplinary approach to understanding population health and health disparities and the elimination of group differences in health.

The specific aims of the proposed Center for Interdisciplinary Health Disparities Research are to:

Aim #1: bring together scientists from inside and outside the University and members of the community who are especially vulnerable to adverse health conditions by virtue of their group membership to inform the Center’s scientific agenda

Aim #2: foster investigations that consider health disparities from multiple levels of analysis via shared conceptual frameworks that integrate discipline-specific theories and methods

Aim #3: increase interest in population health and health disparities among scientists and students from various disciplines and from community members

Aim #4: develop measures and methods that are appropriate for use with vulnerable populations and that allow factors at various levels (social/environmental, behavioral/psychological, and biological) to be analyzed together

Aim #5: increase existing knowledge on the social/environmental, behavioral/psychological, and biological factors that influence health disparities and the nature of their interactions

Aim #6: disseminate findings through channels established through the Center to as wide an audience as possible, including members of vulnerable populations, community-based organizations and agencies, and scientific investigators inside and outside the University.

The scientific agenda of the Center will evolve as gaps in understanding of population health and health disparities are filled via research projects and increased and improved communication with members of the community, and new gaps are revealed. In the first five years of the Center, its efforts will focus on understanding population differences in the incidence and nature of breast cancer among Black and White women. Black women in the United States and West Africa develop breast cancers that occur at a younger age and are more aggressive and more lethal than do White women of Northern European ancestry (Lyman, Kuderer, Lyman, Cox, Reintgen & Baekey, 1997). Center investigators, in projects that build on and inform one another, will take a multi-level approach to understanding Black-White disparities in breast cancer, using animal studies and investigations of Yoruba women in Nigeria and Black women on the South Side of Chicago. The Center's seven components, its four research projects, Tissue Core, Administrative Core, and Pilot Project Program, are described briefly below.

Research Project #1, "Mammary Cancer Risk: Social Isolation and Hypervigilance," will be led by Martha McClintock, Ph.D. McClintock and colleagues have developed an animal model of social regulation of mammary tumor biology that will enable the identification of psychosocial/gene interactions that account for breast cancer disparities among Black and White women. They have established that female rats living in social groups manifest a White-typic pattern, becoming more likely to develop mammary tumors only towards the end of their life spans. In stark contrast, socially isolated rats, which have the same genome, have three times the rate of mammary cancers: the animals are 40% younger and have larger, more aggressive and fatal tumors, similar to the West African pattern. This project will compare the gene regulation in mammary tumors and the ovarian function of socially isolated and group living rats. Doing so will identify the mechanisms for psychosocial and ovarian risk factors, which could be then tested in humans and ultimately used to target the increased surveillance and intervention that would ameliorate the large racial disparity in mammary cancer.

Research Project #2, "Inactivation of BRCA1 and Breast Cancer Risk in Blacks," is led by Olufunmilayo Olopade, M.B.B.S. The vast majority of Black women in the United States are of West African origin. This study will examine the molecular characterization of primary patient samples in Nigeria (where 120 million of the 200 million West Africa residents are concentrated) and the South Side of Chicago, with an ultimate aim of developing targeted therapeutic approaches. Striking similarities that have been noted between BRCA1-related breast cancers and breast cancers that occur in young Black women suggest that alterations in the BRCA1 gene or related pathways might contribute to breast cancer in this group. This project will establish a large bio-specimen repository of breast tumors from Black women that will be invaluable for assessing the multiplicity of reasons why women of West African ancestry develop earlier onset and pathologically more aggressive breast cancer. Psychosocial information will be collected that will allow the animal model of social regulation developed by McClintock and colleagues to be tested in humans.

Research Project #3, "Social Environment, Stress, and Health," is led by Sarah Gehlert, Ph.D. (Principal Investigator) and Christopher Masi, M.D., Ph.D. (Investigator). In this Community-Based Participatory Research (CBPR) project, community members from the areas around the University of Chicago (Chicago's South Side) will work with investigators to understand community views on breast cancer and its treatment with the view of: 1) validating variables and measures from the model of social regulation developed by McClintock and colleagues, and 2) partnering with community members to inform interventions. Subjectively and objectively obtained data will be gathered and used to explore relationships among social factors (such as community and neighborhood features, social connectedness, and living situations), behavioral responses (such as vigilance, satisfaction with living situations, and perception of stress) and biological phenomena (measures of stress and incidence of systemic disease, most notably breast cancer).

Research Project #4, "Social Isolation and Response to Mammary Cancer Therapy," will be led by Suzanne Conzen, M.D. The Sprague Dawley rat model of mammary carcinomas and the SV40 large T transgenic mouse mammary tumor models will be used to investigate the effect of stress on rate of tumor growth, response to chemotherapy, and chemoprevention.

The Tissue Core will be housed near the facilities of the University of Chicago Cancer Research Center (UCCRC) and provides analysis of mammary and breast tissue not available through the UCCRC's 13 facility cores. It will be led by Thomas Krausz, M.D., FRC Path (Principal Investigator) and Maria Tretiakova, M.D., Ph.D. (Investigator).

The aim of **The Administrative Core** is three-fold: 1) to bring together scientists from inside and outside the University and members of the community to foster investigations that consider health disparities from multiple levels of analysis; 2) to disseminate the scientific findings of the Center to as broad an audience as possible; and, 3) to provide an infrastructure that fosters the Center's research agenda and the flow of information into and from the University. Achievement of the first two aims is via the Faculty Colloquium and Monthly Speaker Series, Summer Apprenticeship Program, In-service Program, and preparing an RFA for the Pilot Project Program. The third aim is accomplished via bookkeeping and accounting, grants management on a monthly basis, maintaining personnel records, IRB and IACUC approvals, and the Center's Web site, procuring services, supplies, and equipment, preparing progress and fiscal reports, preserving copies of records, and evaluating the Center's performance.

The Administrative Core is made up of the Director, Co-Director, the Internal Steering and External Advisory Committees. The Internal Steering Committee consists of investigators from the four research projects and Tissue Core. Four scientists, three of whom come from outside the University, and a member of the community-based agency involved in the CBPR project comprise the External Advisory Committee.

The objective of **The Pilot Project Program** is to solicit high-quality, short-term projects on health disparities that fill in gaps in the Center's scientific agenda and have the potential to become fully-funded initiatives. Projects will be solicited via an RFA developed by the Administrative Core and reviewed by an institutional review committee convened each funding year for the purpose.

b. Setting and facilities

The University of Chicago campus lies on Chicago's South Side, immediately adjacent to several communities with some of the least favorable health and economic profiles in the United States. Washington Park, located across the street from the Pritzker School of Medicine, on the western edge of the campus, has the second highest homicide rate of Chicago's 77 community areas, a median household income of \$8,403, and a 31.1% rate of unemployment (Chicago Department of Public Health 2000). It and Woodlawn, which lies immediately south of the University, are within the top 20 of the City's 77 community areas in mortality from heart disease and from all cancers (Chicago Department of Health, 2000). These and other South Side communities have rich ties with the University. A number of students at the School of Social Service Administration (SSA) come from the South Side and many of its graduates work there. SSA has ties with over 35 South Side community agencies through its field education program and operates a free meal program called the Living Room Café in the Woodlawn community. Students from SSA and the Pritzker School of Medicine developed the Washington Park Children's Free Clinic in 1997, and run it from its base in the Church of the Good Shepherd with licensed physician volunteers. Members of South Side communities form much of the patient base of the University of Chicago Medical Center. Each year the hospital serves more than 550,000 outpatients and 25,000 inpatients, more than 60% of whom are from the South Side. This includes providing health care without reimbursement to the poor, totaling \$96 million. The Medical Center is the largest provider of uncompensated and Medicaid services in Illinois. The formation of the Center is strongly supported by the University of Chicago Cancer Research Center (UCCRC), because a key area for its present and future growth is population sciences. Three members of the UCCRC are on the Internal Steering Committee of the Center, including Dr. Olopade, who is the UCCRC's Acting Associate Director for Population Science. The UCCRC has made a commitment to spend about \$1 million in recruitment in population science in the next five years (see letter of support).

The Center for Interdisciplinary Health Disparities Research would be administered through the Institute for Mind and Biology, which is located in the center of the University of Chicago campus, one block from the Pritzker School of Medicine and University of Chicago Cancer Research Center (UCCRC) and two blocks from SSA. This central location allows maximum communication between the various parts of the Center's organization. Two of the four research projects (R01 #2 and 4) and the Tissue Core will be located within the Biological Sciences Division, and will benefit from its resources. A third will be housed in the Institute for Mind and Biology (R01 #1). The CBPR project (R01 #3) would operate from agencies and institutions in South Side communities. The Faculty Colloquium and Monthly Speaker Series, to which the public is invited, would be held in the Institute's spacious lobby, which is designed for the purpose. Meetings of the Institutional Review Committee and Internal Steering and External Advisory Committees will be held in its seminar rooms.

c. Proposed animal models and species, or proposed use of human volunteers

Two of the Center's proposed research projects (R01s #1 and #4) will use Sprague-Dawley strain rats (*Rattus norvegicus*) as animal models. One of the two projects (R01 #4) will also use the C3(1)/SV40 T-Antigen Transgenic Mice (*Mus musculus*). Two proposed research projects (R01 #2 and R01 #3) would use human volunteers: (a) patient populations from the University Hospital of the University of Ibadan (Nigeria) would serve as volunteers in R01 #2, (b) patient populations from the University of Chicago and other South Side hospitals identified through the Cancer Registry would serve as volunteers in R01s #2 and #3, and (c) individuals associated with the Faith Based Wellness Network would serve as volunteers in the Community-Based Participatory Research (CBPR) project (R01 #3).

d. CPHHD organization and administration

The organizational structure of the Center can be found in Figure 1. The Center includes an Internal Steering Committee, an External Advisory Committee, four research projects, two cores (Administrative Core and Tissue Core), and a Pilot Project Program.

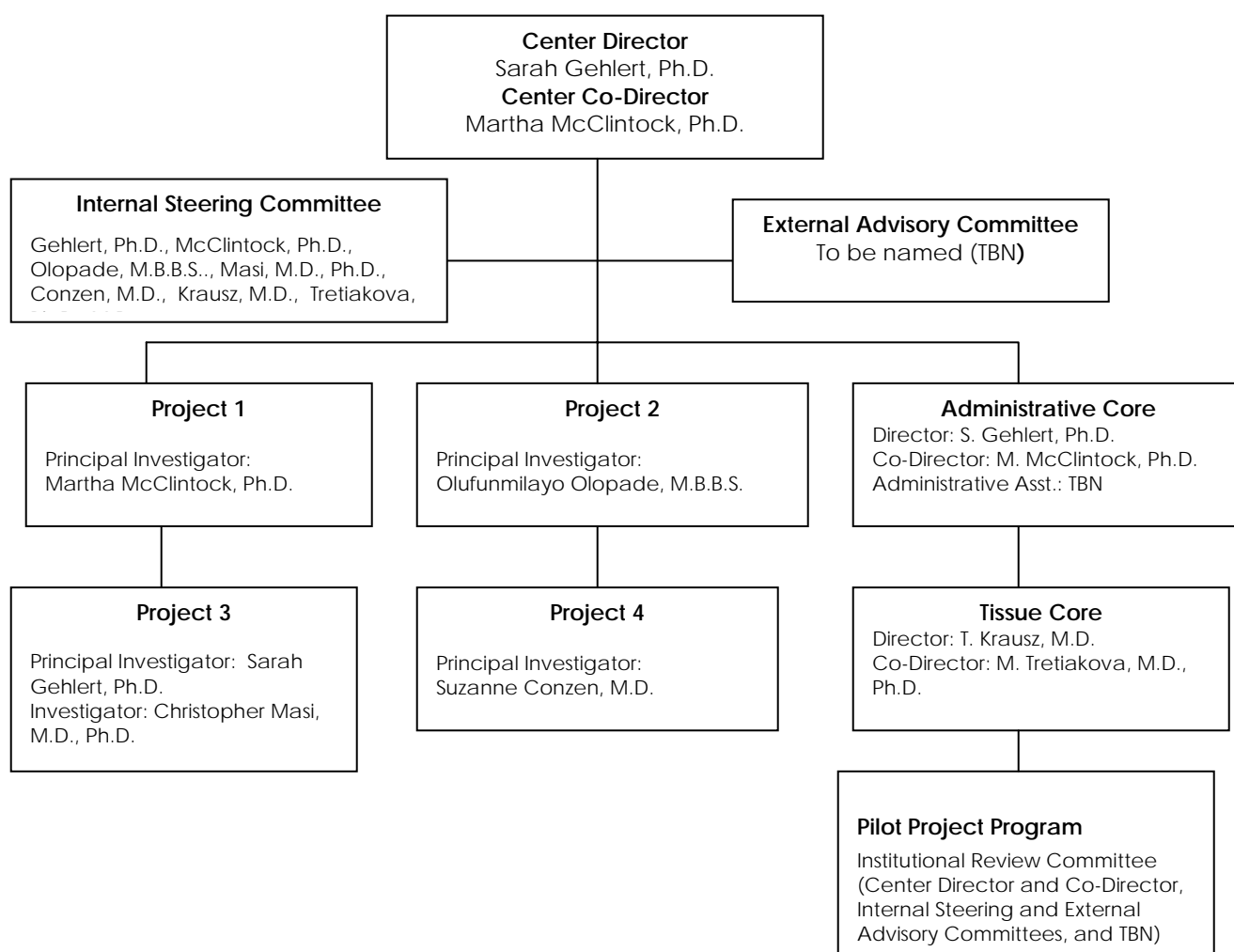


Figure 1. Administrative organization of the Center for Interdisciplinary Health Disparities Research.

Scientific leadership of the Center is provided by the Director, Co-Director, other members of the Internal Steering Committee, and the External Advisory Committee. Although the exact membership of the External Advisory Committee will not be determined until the time that the application is funded, it will be comprised of three scientists from outside the University and a member of the community-based agency affiliated with the CBPR project. That these members come from outside the University will help to ensure a flow of ideas into the

Center and discourage insularity. The seven members of the Internal Steering Committee come from a variety of disciplines and hold memberships on key committees and institutes within the University, as follows:

- Sarah Gehlert, Ph.D. is a member of the faculties of the School of Social Service Administration, Institute for Mind and Biology, Center for Health Administration Studies, and Graduate Program in Health Administration Studies
- Martha McClintock, Ph.D. is a member of the faculties of the Department of Psychology (Committees on Human Development and Biopsychology), Committee on Evolutionary Biology, Committee of Neurobiology, and the College. She is the Director of the Institute for Mind and Biology
- Olufunmilayo Olopade, M.B.B.S. is member of the faculties of the Hematology/Oncology Section of the Department of Medicine, Committee on Genetics, and Committee on Cancer Biology
- Christopher Masi, M.D., Ph.D. is a member of the faculty of the Department of Medicine, Center for Health Administration Studies, and Graduate Program in Health Administration Studies
- Suzanne Conzen, M.D. is a member of the faculties of the Hematology/Oncology Section of the Department of Medicine and Committee on Cancer Biology
- Thomas Krausz, M.D. FRC Path is on the faculty of the Department of Pathology and is Director of Anatomic and Surgical Pathology
- Maria Tretiakova, M.D., Ph.D. is the Research Laboratory Manager of the Human Tissue Resource Center of the Department of Pathology

The Director and Co-Director have worked collaboratively in the training of doctoral students and in research. Dr. Gehlert has a strong interest in group health differences (Gehlert, DiFrancesco, & Chang, 2000; Gehlert, Kovac, Song, & Hartlage, in press; Hartlage & Gehlert, 2001; Spencer, Gehlert, & McClintock, 2002). Her background in anthropology and social work and history of ties with South Side communities will provide the Center with expertise in forming community partnerships and skills in how to maintain working relationships and conducting participatory research. Gehlert's ties to the South Side communities are numerous, and include: 1) mentorship of medical and social work students in the Washington Park Free Children's Clinic through the Albert Schweitzer Fellowship Program; 2) membership on the South Area Board of the American Cancer Society; 3) continuing membership on the Professional Advisory Board of the Chicago affiliate of the Epilepsy Foundation of America; and, 4) experience from 1993 to present on the Internal Steering Committee of the University's Family Support Program, which trains students and advises agencies in how to develop and maintain nonhierarchical partnerships with communities. Dr. Gehlert also has many years of experience administering grants and large research projects. From 1992 through 1998, she was the Principal Investigator of the University's Maternal and Child Health (MCH) Training Program. This program yielded 32 master's level graduates (14 minority) with a specialty in maternal and child health who now hold clinical, administrative, and policy positions in a variety of local, state, and federal agencies. As apart of her position, Dr. Gehlert established and maintained ties with the MCH Program's External Advisory Board of clinicians, government officials, and academics in Maternal and Child Health from the Chicago Area. Data entry was recently completed on her community-based epidemiological study of women's health and mental health (The Prevalence of Premenstrual Dysphoric Disorder), yielding complete information on over 2,000 rural and urban women from 13,300 housing units selected via probability sampling by the National Opinion Research Center. In this study, women were followed from 60 to 155 days (i.e., for two menstrual cycles), with all data collected in their homes. Dr. Gehlert trained and supervised the work of five doctoral students and 45 research assistants, the majority of whom lived in the communities in which they were collecting data.

Dr. McClintock expertise is in the behavioral endocrinology of reproduction in animals and humans; the behavioral, psychological, and social regulation of physiology; and the evolution and interaction of hormones and behavior. She served for over 10 years as the Director of the University's Committee on Biopsychology, a doctoral degree-granting unit of the Department of Psychology. During this time, she designed and oversaw the construction of the \$17 million Biopsychological Sciences Building, which consolidated the biopsychology and social neuroscience laboratories on the University of Chicago campus. The project was completed on time and within budget.

e. Literature Cited

- Chicago Department of Public Health (May, 2000). *Community Area Health Inventory, 1996-1998*. City of Chicago, Department of Public Health.
- Gehlert, S., DiFrancisco, A., & Chang, C.-H. (2000). Black and white differences in the psychosocial outcomes of epilepsy. *Epilepsy Research, 42*, 63-73.
- Gehlert, S., Kovac, K., Song, I., & Hartlage, S. (in press). Understanding the mental health services use of rural women. *Journal of Rural Health*.
- Hartlage, S.A., & Gehlert, S. (2001). Rural and urban Midwestern United States contraception practices. *Contraception, 63*, 319-323.
- Institute of Medicine. Committee on Health and Behavior: Research, Practice and Policy Board on Neuroscience and Behavioral Health. (2001). *Health and Behavior: The Interplay of Biological, Behavioral, and Societal Influences*. Washington, DC: National Academy Press.
- Kahn, R.L., & Prager, D.J. (1994, July 11). Interdisciplinary collaborations are a scientific and social imperative. *The Scientist*, p. 12.
- Lyman, G., Kuderer, N., Lyman, S., Cox, C., Reintgen, D., & Baekey, P. (1997). Importance of race on breast cancer survival. *Annals of Surgical Oncology, 4*, 80-87.
- Spencer, N., Gehlert, S., & McClintock, M. (2002). *Race, socioeconomic status, and diversity of the menstrual cycle throughout the life span*. Manuscript submitted for publication.